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MISSOURI STATE HIGHWAY COMMISSION

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MISSOURI STATE HIGHWAY COMMISSION

Jay B. Dillingham, <i>Chairman</i>	<i>Kansas City</i>
Jack Curtis, <i>Vice-Chairman</i>	<i>Springfield</i>
A. C. Riley, <i>Member</i>	<i>New Madrid</i>
Daniel W. Duncan, <i>Member</i>	<i>St. Joseph</i>
Roy W. Jordan, <i>Member</i>	<i>St. Louis</i>
Roy H. Goodhart, <i>Member</i>	<i>Hannibal</i>
Robert N. Hunter, <i>Chief Engineer</i>	<i>Jefferson City</i>
Bruce A. Ring, <i>Chief Counsel</i>	<i>Jefferson City</i>
Irene Wollenberg, <i>Secretary</i>	<i>Jefferson City</i>

YAWHON
STATE
COMMISSION

Prepared by the Public Information Division

Photos by the Surveys and Plans Division, Photogrammetry Section

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FOREWORD

This Annual Report of the Missouri State Highway Commission contains information about the work accomplished and receipts and expenditures of the State Highway Department during calendar year 1978. It also contains a general statement of the present unmet needs on the state highway system, and it outlines the attack the Commission and Department intend to make on those needs during 1979.

The intent of the report is to provide easy access to statistical information, to briefly convey the general functions of the several Divisions of the State Highway Department, and to briefly outline kinds of work targeted for accomplishment during 1979.

As it discharges its responsibilities under Missouri law, the Department looks to an informed and interested public as final arbiter of the development and operation of Missouri's highway program. Since that is so, copies of this report are available to the news media, and so far as as the number of published copies permits, to interested public officials and private citizens. As required by law, a copy of the report also is being furnished to the Governor.

It is the sincere desire of the Department that the information contained in this Annual Report will help to increase the general understanding of Missouri's highway administration. The Department will welcome inquiries concerning this Annual Report.

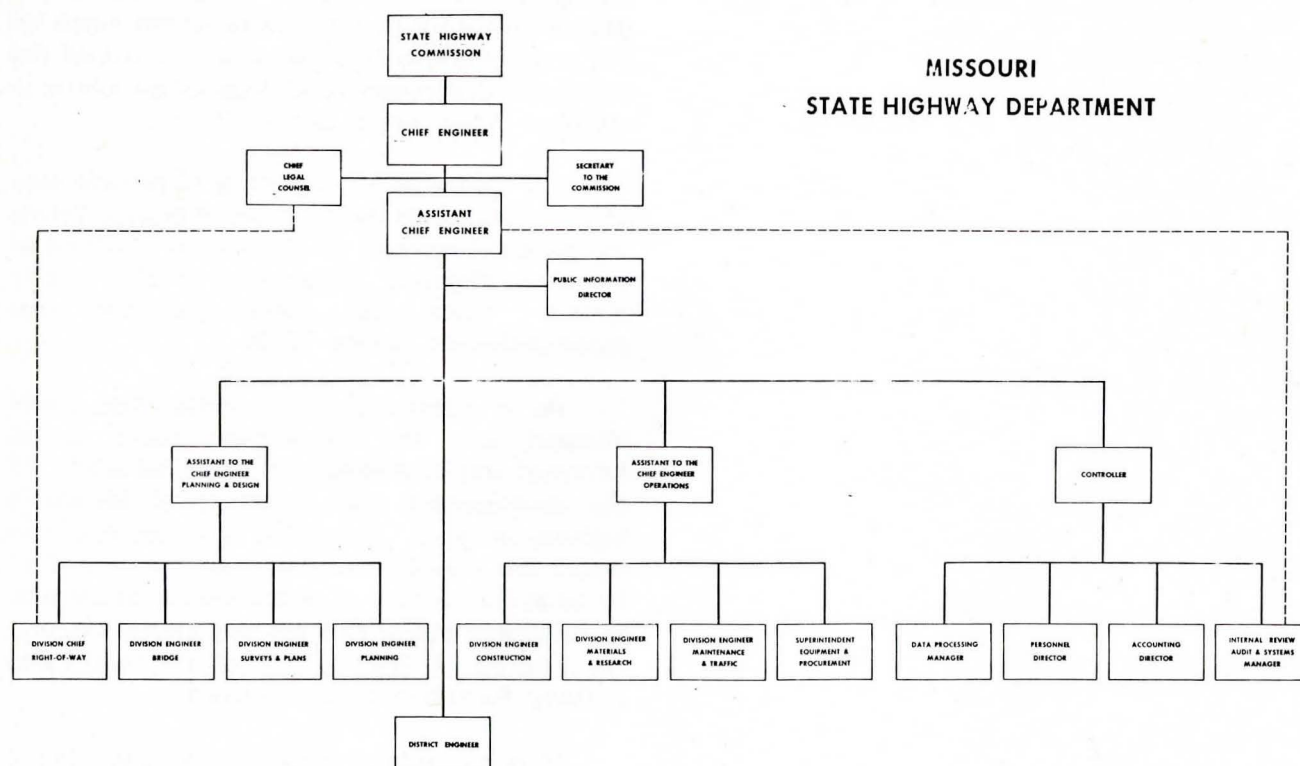
DEPARTMENT ORGANIZATION

The State Highway Department operates as a decentralized organization. Staff assistance and functional control for the various Departmental tasks are provided by the Headquarters Office to the ten geographic Districts of the Department. Each District contains about 12 counties and about 10% of the total road mileage in the state highway system. Each of the Districts is under the direction of a District Engineer, who is responsible for administering all activities in his District.

Bridge design and highway planning functions are handled by Divisions in the

Headquarters Office in Jefferson City which do not have counterparts in the Districts. But, in the main, decisions about highway construction, maintenance and operations are made at the District level, in accordance with procedures and standards established by the State Highway Department.

The State Highway Department has District headquarters offices located at St. Joseph, Macon, Hannibal, Kansas City, Jefferson City, Kirkwood, Joplin, Springfield, Willow Springs, and Sikeston.



THE COMMISSION -

Its Functions and Members

The State Highway Commission acts as a Board of Directors; the State Highway Department as an operating agency in doing the state highway business of the people of Missouri. The Highway Commission establishes the policies and furnishes the overall guidance under which the men and women of the State Highway Department do their work.

The members of the State Highway Commission are appointed to service by the Governor with the advice and consent of the Senate. They are named to overlapping terms of six years, and the law requires that no more than three of them be members of the same political party.

Jay B. Dillingham of Kansas City is the present Chairman of the Commission. He was appointed by Governor Joseph P. Teasdale to a term ending in 1983. A Director of the Kansas City Stockyards Company, the Kansas City Connecting Railroad Company, and the Kansas City Crime Commission, he is a restaurateur with interests in Kansas City and Washington, D.C. Long active in Kansas City area civic and commercial development organizations, Mr. Dillingham has LL.B. and LL.M. degrees from the Kansas City School of Law (now the University of Missouri - Kansas City).

Jack Curtis, Springfield, is the Commission's Vice-Chairman. First appointed to the Commission by Governor Christopher (Kit) Bond in 1973, he presently is in a term of service ending in 1979. A graduate of Drury College in Springfield and the College of Law at the

University of Missouri - Columbia, Mr. Curtis practices law in Springfield and is also a former member of the Missouri General Assembly.

Albert C. Riley, New Madrid, is senior among present Commissioners in service to the State Highway Commission. First appointed by Governor Warren E. Hearnes in 1965, he was most recently reappointed by Governor Teasdale. His current term expires in 1983. Mr. Riley, a graduate of the University of California at Los Angeles, is an agriculture producer and a banker.

Roy W. Jordan, Clayton, is an investment banker and a Vice-President of Merrill Lynch Pierce Fenner and Smith, Inc. He long has been active in the civic development of metropolitan St. Louis, and is a member of numerous service and professional organizations. He was appointed to the Commission by Governor Bond in 1975. His term expires in 1981.

Daniel W. Duncan, St. Joseph, is President of the Iowa-Missouri Walnut Company. He was graduated from the University of Missouri-Columbia with a degree in Forestry. Mr. Duncan was appointed to the Commission by Governor Bond in 1973. His present term expires in 1979.

Roy H. Goodhart, Hannibal, is a banker in the Hannibal area, where he long has been active in service and civic organizations. A graduate of the School of Banking, Madison, Wisconsin, he is President of the Commerce Bank of Hannibal. First appointed to the Commission by Governor Teasdale, Mr. Goodhart presently is serving a term expiring in 1983.

FUNDING NEEDS and FUTURE PROJECTIONS

In Missouri, State Highway Department activities are financed by the receipts from taxes, licenses, and fees from highway users. Under this system of funding, people who use the highways a significant amount pay a significant amount for their use; people who use the highways only a little pay only a little for their use; and people who do not use the highways at all pay nothing at all for their use.

Missouri's state motor fuel tax is low. Of the fifty states, only three have motor fuel taxes lower than Missouri's. Missouri is one of ten states having a 7 cent per gallon fuel tax. Thirty-seven other states and the District of Columbia have higher motor fuel taxes than Missouri.

Yet, the Missouri State Highway Department is responsible for the operation and maintenance of a 32,000 mile system of state highways. Only six states in the nation have state highway systems of greater road mileage than Missouri, and 5 of the 6 collect a higher gas tax: North Carolina, Texas, Virginia, Pennsylvania, South Carolina, and West Virginia.

TRENDS

The main sources of highway revenue in the State of Missouri are motor fuel taxes, motor vehicle license fees, and federal funds. Of these the biggest is the motor fuel tax, which in fiscal year 1977 comprised about 38% of all highway revenues. In that same year federal funds constituted about a third of all available monies and motor vehicle license fees slightly more than a quarter of all highway revenues.

Of significance here is the fact that the percentage of highway revenue in Missouri coming from federal funds is trending sharply downward. As recently as fiscal year 1960 federal funds accounted for more than 45% of all highway revenue in the state. Last year that percentage had shrunk to 32.6%.

Several factors have combined since 1960 to affect the receipt of state highway monies. Motor fuel consumption taxed for highway use has increased during the period. So have motor vehicle registrations. Average passenger car license fees increased from fiscal 1960 to fiscal 1973. In 1973, the year of the fuel crisis, people began buying smaller and more fuel-efficient cars. Since 1973 the average passenger car license fee has declined.

The State Highway Department now is able to accomplish far less than was the case as recently as 1960. The principal cause of this unhappy fact is the Department's diminished purchasing power resulting from the ravages of inflation. Almost every single item of material and labor involved in highway work has been adversely impacted by the inflation which has infected the general economy. In addition, improved standards for highway design and greatly complicated procedures -- many of them imposed on the Department by the Federal Government -- have added significantly to the cost of the finished highway product. So have environmental considerations and concerns -- many of them extremely expensive to mitigate.

These factors have combined to create a situation in which the State Highway Department, in dollars of 1960 value, has far less purchasing power now than it did then -- and can build only about one-fourth of the miles of highway improvements per dollar spent than it could build then.

Another factor adversely impacting State Highway Department money available for disbursement has been the channeling of steadily increasing amounts of highway funds into other agencies of state government. In 1960, a total of about \$7-1/2 million of highway funds was utilized by other state agencies. In 1978, the total so used was in excess of \$50 million. The Missouri State Highway Patrol has been the chief beneficiary of the increased use of State Highway money. But the Department of Revenue, the

State Auditor's Office, the Office of Administration, and several other agencies of state government also have received significant amounts of highway money.

NEEDS

In 1970 the Federal Department of Transportation directed that a National Transportation Study be made. The study was to be made by each of the 50 states, and the criteria governing it were to be established at the federal level. Reports were to be furnished to the Congress on a biennial basis, and the reports were to encompass total transportation needs for a 20 year period in all modes of transportation -- highways, rail, air and water.

In Missouri the people of the State Highway Department examined highway needs and, using the standards which had been developed at the federal level, made estimates concerning what it would take to bring Missouri's state highway system to the levels of adequacy indicated for that 20 year period.

The study which went to the Congress in 1972 showed that for the next 20 years, 80% to 85% of the total transportation needs were going to occur on the nation's roads, streets, and highways. The State Highway Department examined the 1972 report and found that about 80% of the deficiencies needed to be met within 10 rather than 20 years. The fixed 1971 costs included in the original report were adjusted to current dollar values, and it was found that to meet the needs identified in a ten year period would have called for a ten year expenditure on the state highway system of 16.7 billion dollars, or 1.67 billion dollars a year.

There was no realistic hope that the people of Missouri would provide finances for a program of that magnitude. Since needs were greatly in excess of resources available or envisioned, the task became one of then identifying the most pressing needs the report had uncovered, and meeting those needs with the available resources.

SOME CAPACITY DEFICIENCIES: BRIDGES AND ROADWAYS

In addition to its numerous bridges which need upgrading, portions of the Missouri State Highway System presently suffer from significant capacity problems. These problems are attacked in this way: on those sections of the state highway system carrying 3,000 cars per day or less, improvements are considered only when the roads are operating right now at 200% capacity or something greater than that. On those sections of the state highway system carrying between 3,000 and 5,000 cars per day, improvements are considered on stretches of the road presently operating in excess of 180% capacity. On those sections of the road carrying 5,000 cars per day or more, those most heavily traveled sections of the state highway system, improvements are considered on stretches now operating 100% of capacity or more.

This, then, identifies those sections of the system which most urgently require immediate improvement to improve capacity and reduce congestion. Some of these sections are scheduled for improvement in the current Right-of-Way and Construction Program.

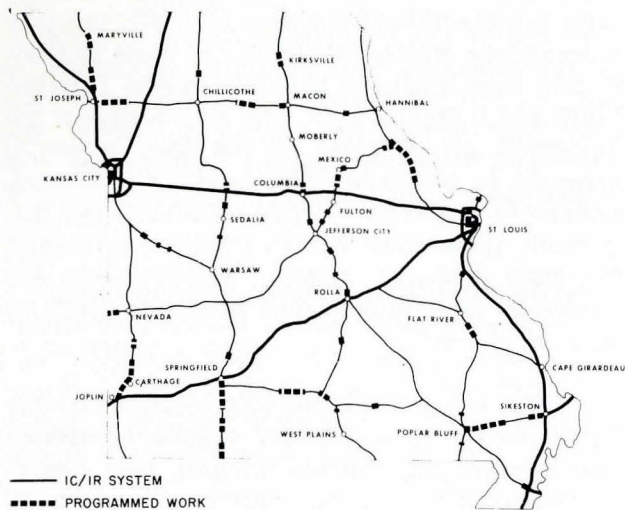
FUNDING SHORTFALL

Estimates have been made in an attempt to find out how much money is needed just to take care of the most basic needs of the kind which have been enumerated here. The figure is of the order of 340 million dollars annually for the next ten years. When that figure is compared with the approximately 200 million dollars annually which now is available for construction, a 140 million dollar a year shortfall appears. (This estimate is based on inflation trends apparent in 1975 and 1976. Current inflation rates are higher and consequently estimates based on current trends will be higher.)

To successfully overcome that shortfall would require a doubling of the state motor fuel tax, and of course any such increase as that is completely unrealistic. Nevertheless, that is the need, and one of the obligations of the State Highway Department is to make that need known to responsible Missourians in all walks of life.

STATE INNER-CITY AND INTER-REGIONAL HIGHWAY SYSTEM

Comparison-IC/IR System
and Programmed Work



The proposed Intercity-Interregional highway system -- a supplemental freeway system -- was designed to extend beyond the Interstate and to serve the most important population centers of the state. This system would carry the heaviest volume of traffic. It was laid out, and in 1969 a bond issue was considered as a means of accelerating work on it. The bond issue did not materialize, but the State Highway Department did receive an increase in its motor fuel tax in 1972.

The illustration shows the progress which is being made on the IC/IR system -- work which is underway or programmed on various segments. And, of course, some of it has already been built. For instance, the section of Route 71 from Kansas City to Nevada has been completed, as have some sections on Route 61 in Northeast Missouri.

Both the St. Louis and the Kansas City metropolitan areas have pressing highway needs. These are being attacked on a priority basis as funds allow.

RIGHT-OF-WAY & CONSTRUCTION PLAN

The sections of the state highway system programmed for improvement are balanced against the Highway Department's continuing forecasts of incoming revenue. Out of that balance comes the right-of-way and construction program. The program is reviewed and approved by the State Highway Commission in the early part of each calendar year.

There has been concern within Missouri and nationwide for some time now, that because of the many federal procedural requirements involved in road building, it is almost impossible to bring a highway project of any size from concept to contract in five years. Seven or eight years is a much more realistic time frame if the project involved is of a major nature. There are public hearings; there are environmental impact statements; there are air quality requirements; there are water quality requirements; there are historical, scenic, and archaeological impacts which have to be dealt with -- and all of this takes time.

Because of these concerns the Highway Department now is in the process of modifying the structure and length of its Right-of-Way and Construction Program. The newly structured program will list projects and their anticipated costs for the first year, a second year's worth of standby projects, and five additional years of work for which money is anticipated. Should a project in the first year fall by the wayside, one of the standby projects can be moved into the first year to replace it. Some overprogramming will be done to compensate for those situations in which projects cannot be implemented. An example of that sort of situation can be found in St. Louis County, where the Highway Commission abandoned a project planned at Mason Road and Highway 40 in the face of strong opposition voiced at a public hearing.

Once the program is approved by the Highway Commission, the Department proceeds with a pre-location study meeting, at which

suggestions are invited from interested citizens. After that meeting, the Highway Department proceeds with alternative location studies. Several locations may be studied, and the results of these studies are presented to the public at another meeting -- this one called the location public hearing. If the project is relatively minor -- the widening of a stretch of road, for example -- the Department will hold a combined location and design public hearing. Public reactions to the various locations are evaluated. This information is then used by the Department and Commission in determining the best alternate for the improvement.

With a location established, the Highway Department proceeds with design on that location. When the design has been brought to a certain stage of development, a design public hearing is held. That meeting, which is open to all interested citizens, serves the basic purpose of getting public comments on the design. But on any project of significance, the Department holds a location hearing first, considers the comments made, and then holds a design hearing. Sometimes the comments of the people at public hearings result in the Highway Department selecting an alternative to the one it first selected; sometimes several changes are made as a result of the discussions held at these hearings. But eventually the Highway Department will arrive at a consensus recommendation or make modifications in its first recommendation and take that recommendation to the Commission for its consideration and approval.

So there is a great deal of public input at these hearings. The hearings are open. The details of the Highway Department's Right-of-Way and Construction Program are open, too, and any citizen interested in learning how that program will affect his day-to-day life or his entrepreneurial interests has easy access to the program at the Headquarters Office in Jefferson City or Highway Department District Offices.

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II. 1978 PROGRAMS - BEGUN AND ADVANCED

Energy Conservation Increased: Buildings, Motor Fleet, Elsewhere

Energy conservation for 1978 took many forms in the State Highway Department. A special program was set out to conserve electricity in District Offices and the Main Office, including reduced temperatures and less lighting in non-essential office areas. Also, the Department dropped down to compact size cars to replenish its 1978 motor vehicle fleet.

During the bitter winter of 1978, Governor Joseph P. Teasdale asked all state departments to report progress in their conservation efforts to him, following an Executive Order for all state departments to submit a management plan aimed at reducing energy consumption by 10%.

The Department, which was already devoting major attention to the matter of conserving energy and resources, accelerated its program in a number of areas:

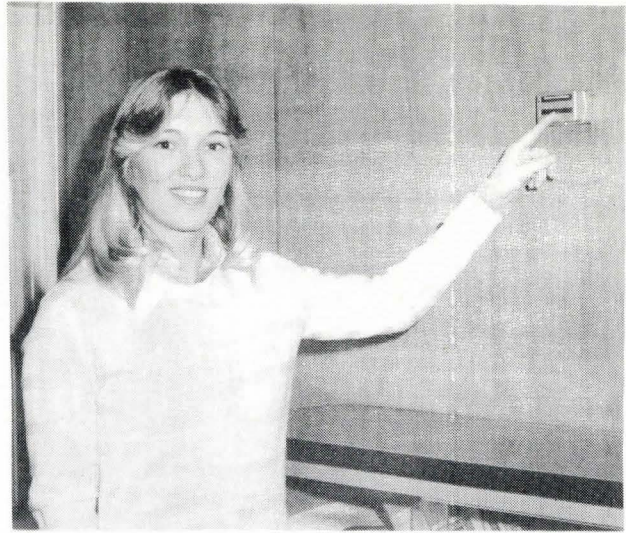
BUILDINGS

Some building conservation efforts had already shown a savings at the time the Executive Order was issued. Since they were already in effect, their annual savings was already identified in the following areas:

1) reduction in highway lighting -- this effort already in effect prior to the January, 1978 Executive Order, had shown a \$100,000 savings in electricity costs in 1976, over the 1975 figure.

2) recycling various materials in maintenance activities - such as the purchase of a guardrail straightener to make reusable bent guardrails which had earlier been scrapped. This activity had produced an annual saving of \$67,000. The Sign Reclamation Plant was the newest venture into recycling and energy conservation and showed a savings of \$171,000 in 1978.

3) a reduction in the centerline paint thickness on pavement -- what sounds at first like a tiny reduction -- actually amounted to an annual savings in paint costs of \$1 million.



Thermostats were lowered to 68 degrees.

4) reduced mowing policy - resulting in a 52,000 gallon decrease in gasoline used in tractors while mowing.

5) increased use of emulsion asphalts - showing a decreased consumption of 3.4 million gallons of kerosene and fuel oil type petroleum products which are required when cutback asphalts are used instead.

In addition to the above named measures already implemented, new emphasis was placed on the proper insulation of pipes and ductwork for heating and cooling equipment, the discreet use of lights and heating, and thermostat settings of 68 degrees. Also, lights were turned off at nights in the Main Office in areas where custodial work had already been completed.

MOTOR POOL FLEET

There was a continuation of the share-the-ride policy in which individuals going into the same area on highway business were encouraged to travel together, thus requiring only one vehicle.

Regarding the purchase of new autos for fleet replacement, it was determined that all replacement vehicles, some 160 in all for 1978, would be compacts. The 1978 compact was determined to be in compliance with federally imposed standards requiring fuel efficient engines, which, in turn, would also serve to reduce the total overall fuel consumption of the fleet.

Another savings effort was directed toward maintenance of present vehicles to their top efficiency, even those nearing replacement. This

was to assure getting the greatest fuel efficiency, as well as providing reliable transportation from all vehicles. And this type of maintenance efficiency pays off when the vehicles are eventually traded in.

All in all, while only some of the Department's successful efforts can be measured simply by dollars and cents, a renewed emphasis on a longheld theme of conserving those resources at hand was incorporated in all the Department's 1978 programs.



Volares were one of several compacts added to the replacement fleet.

Sign Reclamation Plant Continues: \$3 for Every \$1 Invested

A nationwide attention getter has been the Department's Sign Reclamation Plant where formerly scrapped highway signs can now be claimed for reuse along Missouri highways. While not the very first, Missouri's operation is still so unique that numerous visitors from this and other states have toured the new facility.

The Plant was initiated not only to reclaim signs, but also to improve energy and materials conservation, and provide a financial decelerator to rising metal costs to the Department.

The first year of operation completed during 1978, shows some impressive figures: Some 157,000 square feet of metal signing has been reclaimed. With the Plant's annual operation costs of about \$58,000, a savings of some \$171,000 was realized in the first year.

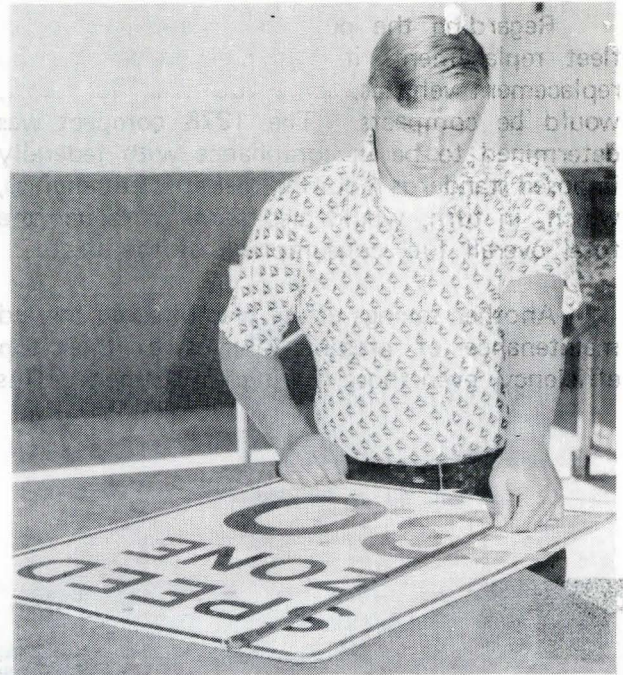
Prior to the Reclamation Plant's opening, it was possible to reclaim only about 20% of the damaged signs returned from the roadways. Refinishing under the old system required that the used sign blanks be in extremely good condition, without bullet holes or any serious dents or bends. The remaining 80% of damaged signs simply went to the scrap heap.

The old process was inefficient; aluminum and steel costs were skyrocketing; and the need for replacements was accelerating as well. Before the Plant's inception, Missouri seemed to have a "no win" situation on its hands.

Missouri is one of the first to undertake the reclamation process, after viewing the successful operation of a similar plant in Nebraska.

The process involves a machine for straightening sign blanks similar to the guardrail and post straightener machines; a machine for mechanically stripping the finish from the signs (as opposed to the chemical process then being used); and shearing and punching equipment for resizing the straightened and stripped blanks.

The reclamation process basically involves refinishing the existing signs as well as the secondary process of salvaging reusable portions for making smaller signs.



Sign reclamation requires determining the portion of the sign which is salvagable.

The signs are passed through a straightener to roll out dents. Next through the sander to remove the old paint and reflective sheeting to produce an aluminum or steel blank ready for a new traffic logo at the Sign Shop.

The operation is extremely clean. The dust is siphoned outside into a settling tank. The sander can clean as many as 700 sign blanks a day. With two 50 hp motors and five moving parts on the sander, it is necessary that there be positive disposal of dust particles. All the work at the Plant is done by three men.

Now entering its second year, the Department has found this Sign Reclamation Plant operation has been able to sharply reduce the need to purchase new aluminum for road signs. It is estimated that the Plant's savings will be even greater this second year, after having passed through the first year's "gearing up" phase.

Signing, Strengthening Missouri Bridges

The conditions of bridges on the Primary System remained a major concern for the Department in 1978. In April, the Department began signing about 150 bridges on the Primary System which could not carry maximum legal loads in normal lanes at normal speeds. Seventeen of these bridges remained open only through the Department's efforts at lowering the speed limit, special positioning of loads crossing, or both.

Triple axle vehicles were prohibited from using all these bridges. The "18-wheelers" were allowed to continue use of 9 of the 17, with load restrictions in force.

In four month's time, the Department had made conspicuous headway in its efforts to upgrade this group of 17 special-needs bridges. Three had been strengthened to the point where the earlier imposed weight restrictions could be removed entirely.

Two more had been strengthened sufficiently to allow removal of the weight restrictions, now requiring only a speed control on passing vehicles.

Since April, separate construction contracts had been let to replace two more of the affected

17 structures. And another replacement bridge contract was scheduled upon completion of right-of-way acquisition.

At the time the initial signing was announced in April, all ten District Engineers met with groups interested in more detailed information about the signing of bridges in their own areas.

At present, a number of bridges, both restricted and controlled, are programmed for improvement. In the meantime, studies also continue to determine the possibilities of strengthening particularly the restricted bridges, and also some of the controlled bridges, especially where the imposition of controls poses particular problems.

Fifty-one bridges on the Missouri State Highway System were previously signed as a result of conditions observed in the Highway Department's regular bridge inspections. These inspections will continue, and other bridges on the System will be signed as conditions warrant.

Critical corridors will continue to receive priority attention in the State Highway Department's on-going program of strengthening bridges still signed for maximum load limits.

Aid to Cities, Counties

NEW DEPT. PROGRAM OFFERS IMPROVED PROTECTION AT RR CROSSINGS ON CITY STREETS AND COUNTY ROADS

Final plans and paperwork were completed in late 1978 to implement a new program designed to make railroad crossings in Missouri safer. This program is aimed increasingly at county roads and city streets.

The new program and the reasons for it are clear:

Any person who has been unlucky enough to witness the effects of a collision between a motor vehicle and a railroad train knows what horrors such collisions produce.

In Spring, 1978 the Department made a survey of locations in the state where streets and roads cross railroad lines. On the basis of that survey, the Department found that in order to be brought to a minimum of safety, crossings on city streets and county roads require installation of 6400 advance warning signs, installation of more than 5000 crossbuck-type warning signs at the road-and-track intersection, and the painting of more than 2000 advance pavement markings. This must be accomplished just to bring these crossings to the bare safety minimums.

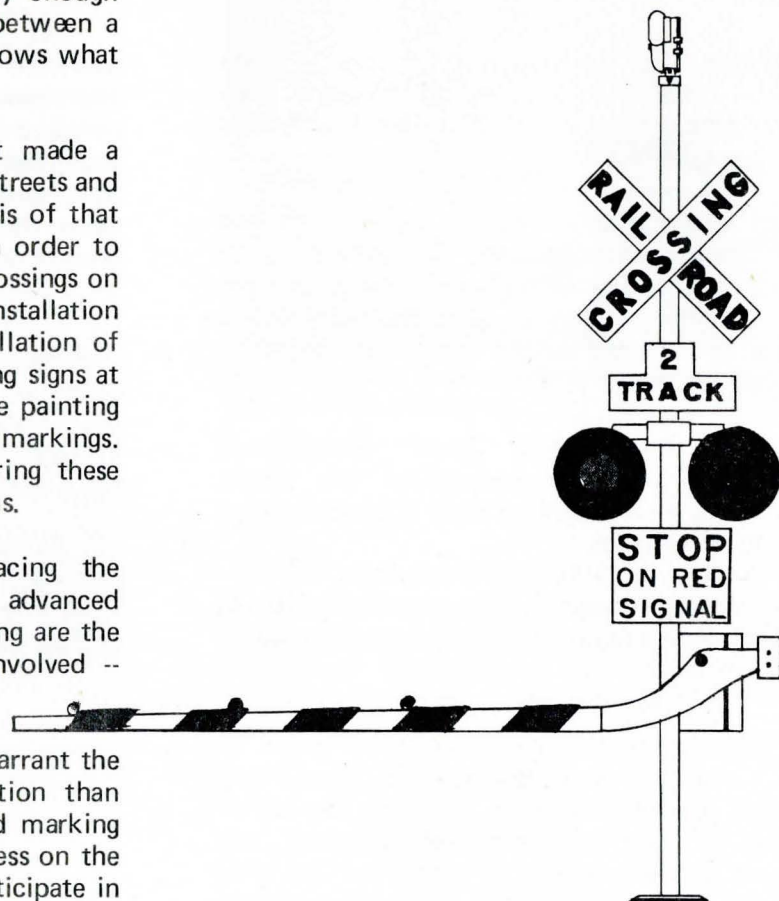
The railroad companies are placing the crossbucks, but installation of the advanced warning signs and the pavement marking are the responsibility of the road agencies involved -- those cities and counties in need.

In those cases where conditions warrant the installation of more extensive protection than that provided by the basic signing and marking described above, an expressed willingness on the part of city or county officials to participate in the program will not always result in the work being done immediately.

All crossings are going to get the signing. But where more protection is warranted -- where the installation of flashing lights is indicated, for example - the priorities which have been set up for doing the work must be considered. The most dangerous crossings must be improved first, and some of the less dangerous ones may not get the

more sophisticated improvements they need until the more dangerous crossings have been dealt with first.

Detailed information on the new program, to begin operation in January, 1979, is available to those cities and counties at all the Department's District Offices.



This is a brand new program with the potential of increasing safety at all railroad crossings in Missouri. The program is easy to participate in, and its cost to participating cities and counties is low. It is the Department's hope, in implementing the program, that as many cities and counties as possible will choose to participate.

TEAP-BEAP PROGRAMS LEND VALUABLE ASSISTANCE TO CITIES, COUNTIES

The Missouri State Highway Department is continuing to extend engineering assistance to cities and counties seeking help with traffic and bridge operational problems occurring off the state highway system.

The help to the local government jurisdictions from the State Highway Department is being offered at no cost to the local jurisdictions, and involves low cost, quick-response solutions to specific traffic and bridge problems.

The bridge problems are dealt with through the State Highway Department's Bridge Engineering Assistance Program (BEAP), whose services are limited to repair and maintenance recommendations for existing structures on city and county highway systems. The Bridge Engineering Assistance Program does not provide for the planning or design of new bridge installations.

The help to counties and cities with traffic engineering problems on their systems is being extended through the State Highway Department's Traffic Engineering Assistance Program (TEAP). A typical application of this program might be the extending of engineering help on the correction of a high-accident intersection.

In the cases of both the bridge and traffic assistance programs, the local jurisdictions involved will be called on to provide backup support in some non-engineering technical activities, such as the manual counting of traffic or the making of necessary physical measurements.

WORKSHOP FOLLOW-UP ON TRAFFIC ACCIDENT MANUAL

The State Highway Department furnished the state's smaller city and county governmental jurisdictions with an effective means of attacking the problem of high accident locations. And the response to the help extended has been impressive, both within Missouri and from other states as well.

In 1978 a workshop gave city and county personnel practical hands-on experience using The Manual on Identification, Analysis, and Correction of Highway Accident Locations. This manual has gained national recognition as an innovative and highly practical working tool.

Included in the two-day session were instructions for carrying out specific procedures, problem-solving activities, and on-site field reviews. Instruction was given by three professional traffic engineers from the Department, including the two authors of the manual. This was the third such session.

The manual was first distributed prior to 1978 to the state's city and county governmental jurisdictions. It grew out of the Department's contract with the Midwest Research Institute of Kansas City to develop such a manual, with guidance and assistance from traffic engineers.

Pool Parking Lots Continue Gain in Use

Several pool parking facilities in the Kansas City and St. Louis areas were expanded and new ones opened due to increased demand. This was done in an effort to ease traffic congestion during peak traffic periods in metropolitan areas, and also encourage motorists in fuel conservation.

Newly opened facilities in the Kansas City area included a 21 car lot opened in western Johnson County on U.S. Route 50, near the community of Elm. One expanded lot in Jackson County at I-70 and Missouri 7 near Blue Springs grew from a 37 car to a 68 car capacity.

Also, a Jefferson County facility with 46 spaces, sometimes filled to overflowing, was expanded to accommodate 86 cars in late November. Its location is on I-55 and Richardson Road.

The opening and expanding of these facilities brings to 35 the number of pool parking lots being operated by the Missouri State Highway Department for the convenience of commuters in the state's metropolitan areas. Total capacity of the 35 lots is about 1750 cars. Twenty-one of the facilities serve St. Louis area

commuters and 12 serve commuters into and out of metropolitan Kansas City. Another lot operates for the convenience of St. Joseph area commuters, and still another serves commuters in the Hannibal area.

In mid-1975 an average of 306 cars per working day used the lots. By October, 1978 that average had grown to just under 1000. In October, an average of 56% of all commuter parking spaces available in State Highway Department pool parking lots were in use statewide.

The Department offers pool parking facilities for the convenience of Missouri commuters. Their use results in cash savings for the car-poolers, saves motor fuel, and lowers the number of vehicles on our highways in many of Missouri's metropolitan areas -- particularly in the times of peak traffic loads on those highways.

The Department intends to continue to monitor the use of these parking facilities closely, and make more of them available as the demand for them is indicated.

III. INTERSTATE PROGRESS AND COMPLETIONS IN 1978

2 Major Interstate Links Finished

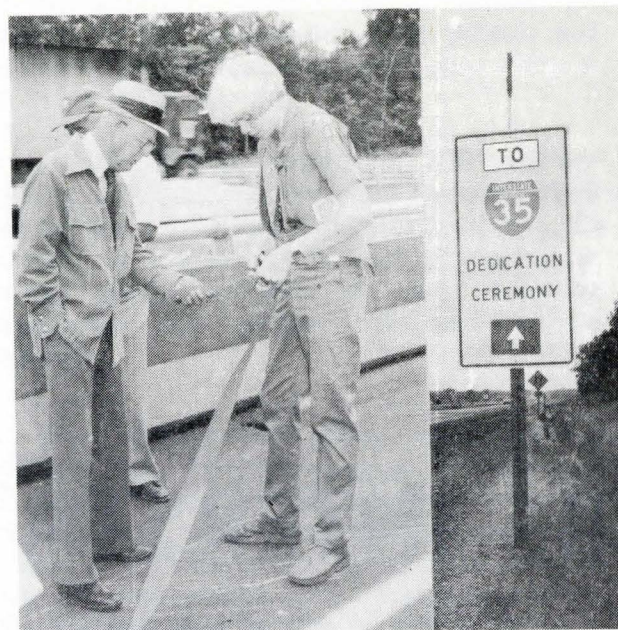
I-57 MISSISSIPPI BRIDGE OPENS: FINAL LINK JOINING CHICAGO AND NEW ORLEANS

One of the nation's major river crossings is the I-57 bridge at Cairo, IL, constructed as a joint venture between the Illinois Department of Transportation and the Missouri State Highway Department. The bridge serves as the final link making possible uninterrupted travel between Chicago and New Orleans by way of I-55 and I-57.

Begun in 1972, the Mississippi River crossing was built at a cost of about \$25 million. The four lane bridge elevates to 800 feet to clear a main navigation opening for river barge and boat traffic. Clearance from the bridge to the river at its normal level is about 60 feet. Record flooding and high waters during 1973 and 1974 delayed construction. And flooding conditions also hampered work in other years.

Including the approaches, the entire section open to traffic is 11 miles long and costs in the area of \$50 million. The bridge itself is 4090 feet long.

Actual construction of the bridge was supervised by the Illinois Department of Transportation, with Missouri sharing equally in the costs of the joint venture.



I-35 COMPLETE IN MISSOURI

Interstate 35, from Kansas City north to the Iowa State Line, achieved 100% completion in Missouri with the opening of the final 2.6 mile section in northwest Missouri, June 23.

Interstate 35 originates at Laredo, Texas, and proceeds northerly terminating in Duluth, Minnesota. On its way, it passes through the states of Oklahoma, Kansas, Missouri, Iowa, and Minnesota. Completion of the Missouri segment of I-35 achieved one of the Department's major goals in the Seventies, closing the gap between Kansas City and the Iowa State Line.

A small ceremony marked the completion of Missouri's final segment, taking place on the 1335 foot long Grand River bridge.

Opening of this segment made almost complete the entire 1570 mile corridor between Duluth, MN and Laredo, TX - or from Canada to Mexico. This is a very important event in Missouri's portion of the Interstate System -- called the largest public works project in the world.

New I-70 Bridge on Missouri at St. Charles Opens Nearly 1 Year Ahead of Schedule

Commuters in the St. Charles-St. Louis area found their travel time cut considerably with the opening of the St. Charles I-70 bridge over the Missouri River on November 28. The \$32 million structure saw completion nearly a year ahead of schedule through an agreement between the Department and Millstone Construction, Inc. The speeded-up schedule was accomplished by the use of larger crews, longer hours, and more equipment, and brought an additional cost of \$1.2 million to the project.

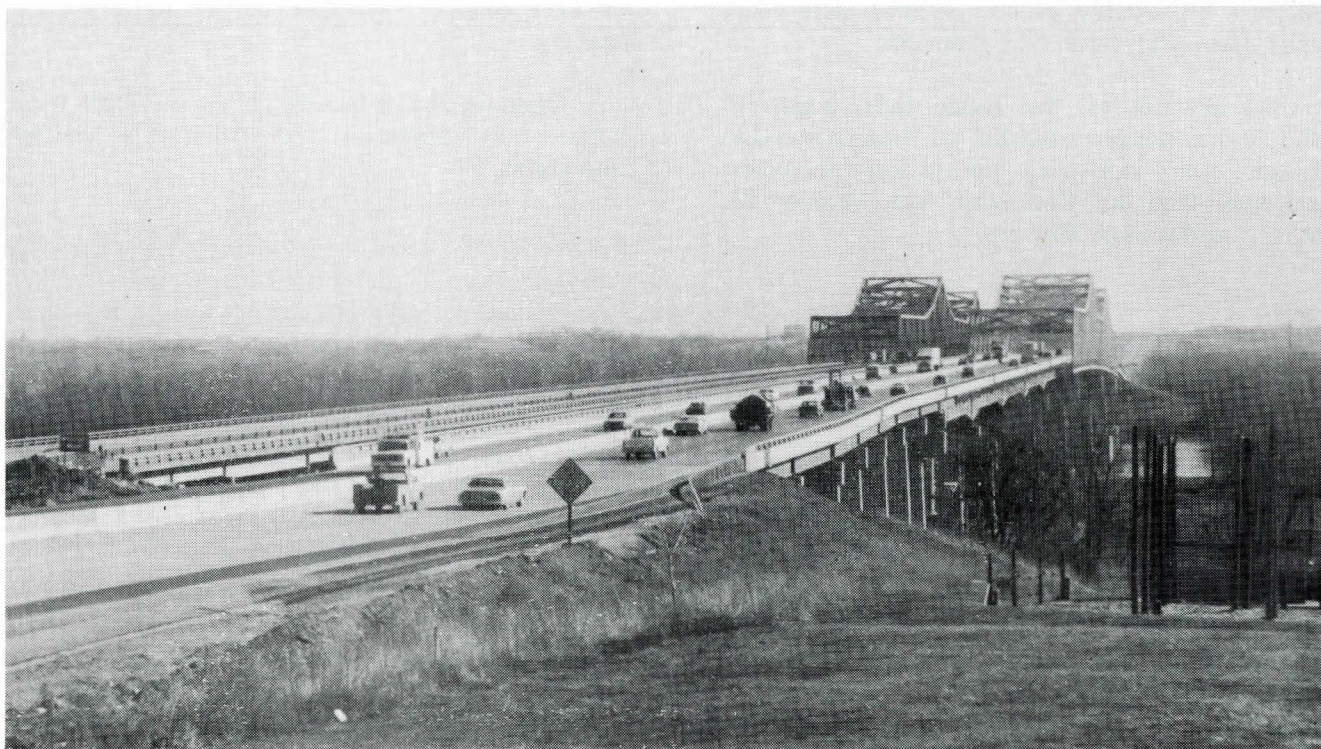
The river crossing carries an average daily traffic count of 80,000 vehicles. As soon as the new bridge was opened to traffic, the adjacent old bridge was closed for \$10 million worth of deck, pier and steel renovation, to be completed in late 1979.

When the older bridge's renovation is complete, each 4 lane structure will carry traffic one-way. But for now, the new structure is carrying two-way traffic, using bridge shoulders to permit 3 lane travel each way.

Construction was accelerated on this project to alleviate to the greatest extent possible the traffic congestion which existed at the I-70 crossing at St. Charles. Since opening of the new bridge with its 6 lanes of traffic, commuters are reporting saving as much as 45 minutes to 1 hour in travel time to their work. And, when the older bridge reopens later in 1979, this time saved could increase.

The new bridge now in use is constructed of three spans of truss and 16 spans of girder. It is 68 feet wide, 12 feet wider than the old bridge, and includes a walkway constructed beneath the deck to simplify bridge maintenance inspection. When traffic is in its final position, the bridge will also have shoulders on each side, a feature the old structure lacked.

In addition, this bridge has fewer box members, limiting the amount of birdlife which can perch on the steel superstructure.



The new I-70 bridge at St. Charles has alleviated rush hour traffic problems.

ST. LOUIS INNER BELT (ROUTE 725) BECOMES I-170

Efforts by Chief Engineer Robert N. Hunter and Missouri's Congressional delegation won Interstate designation for a part of the Inner Belt highway in St. Louis County. This was made possible after the Chief Engineer had resubmitted the request that Missouri Route 725 be designated as Interstate highway, done upon learning that the Federal Highway Administrator had available some 39 miles for redesignation as Interstate across the nation.

On April 7, the Federal Highway Administrator met in St. Louis with Mr. Hunter, Highway Commissioner Roy W. Jordan and Congressional representatives from Missouri to discuss Route 725 and make a field inspection of that route.

Later the same month, the Department received word that the Interstate designation had been granted. Hence that portion of Route 725 between I-270 and I-70, and running roughly parallel to Brown Road, would become I-170. The Interstate designation meant that the 3 mile stretch will probably be completed several years earlier than the state had planned.

Completion of the Inner Belt, begun in 1955, is considered essential to ease congestion around the industrial complexes including McDonnell-Douglas Company and Lambert-St. Louis International Airport.

NEWEST REST AREA OPENED ON I-44; TOTAL NOW 17

The newest of Missouri's Interstate highway rest areas was opened in Phelps County, June 24. The new complex, 7 miles west of Rolla, features identical facilities on both sides serving east and west traffic.

The main structure features a Colonial design and includes special accommodations for the handicapped. Buildings are red brick with wood shingle roofs and quarry-tile floors. Set in a wooded area, they contain restrooms and serve as a hub for parking areas, picnic tables, and shelters. Both rest areas have freeway entrances, drinking water, electric lights and telephones.

For the handicapped there are specially designed ramps from parking lots, lowered drinking fountains, and modified restroom facilities.

Rest areas are situated at key points along the Interstate as both a convenience to the traveler and a safety feature, inviting the wayfarer to take a brief refresher before resuming his journey.

Opening of this facility brings to 17 the total number in operation on Missouri's various Interstates.

IV. OTHER MAJOR ACHIEVEMENTS IN 1978

Reversible Lanes on Routes 40-61 Bridge Eliminate Bottleneck

Installation of a new lane signalization system has virtually eliminated a major traffic snarl on the U.S. Routes 40-61 bridge at Gumbo, in St. Louis County.

This project involved creating a third (center) lane across the bridge. This "third lane" serves as a reversible lane with overhead light signals to indicate its directional use. The reversible lane then designates the direction of traffic during peak periods. A similar effort the previous year proved quite successful on the Missouri River bridge at Jefferson City. Traffic congestion there eased measurably with the addition of the reversible lane.

Installing the new system involved a change in lane striping on the bridge and bridge approaches, and lane control signals. The structure previously had two 12-foot lanes with 4-foot shoulders. The facility now has been restriped to 3 lanes with an average lane width of 10-1/2 feet and no shoulders.

During morning peak traffic hours when the heavy flow of traffic is from west of St. Louis into the area, overhead lane control signal lights allow 2 lanes of traffic to flow eastbound, leaving the third lane to carry westbound traffic.

During afternoon peak traffic hours the overhead lane control signal lights permit two lanes of westbound traffic to operate as an accommodation to outgoing traffic while the third lane is left for the use of eastbound motorists.

In the event of major sporting events on weekends -- such as University of Missouri football games -- and other activities generating particularly heavy traffic, the system will be operated to handle peaking traffic.

Prior to the Highway Department's installation of the reversible lane system, the 2 lane bridge and its approaches had become a peak hour traffic bottleneck. Long back-ups on Routes 40-61 were characteristic of this period. Stop and go driving conditions were common.

Now, all this has changed for the better. Highway Department engineers estimate that the new system will maintain the present free flow operations for several years under present traffic patterns.

Department officials pointed out that the improvement has been installed with the viewpoint that it will be temporary in nature because a new companion bridge across the river is scheduled for construction.

Kansas City's ASB Bridge:

Dept and Cities Working Together Toward a Mutual Solution

Originally opened to traffic 66 years ago and subjected between that time and this to increasingly heavy loads of motor vehicular and rail traffic, Kansas City's storied ASB Bridge has gone about as far as it can go. Originally, the bridge -- which provides the only direct link between Kansas City's central business district and Kansas City North -- was financed and built by a joint effort of Armour Packing Company, Swift Packing Company, and the Burlington Railroad. In 1927, the State Highway Department assumed ownership and responsibility for maintaining the bridge, including its rail portion.

In 1974, a condition survey by the State Highway Department revealed that substantial rehabilitation work would be necessary if the bridge was to safely continue to carry both trains and motor vehicles. The Highway Department proceeded with studies and proposed 3 possible courses of action:

1. Repair portions of the bridge's substructure and superstructure, and replace the deck.
2. Build a new bridge immediately downstream from the present structure.
3. Remove the present bridge's upper deck and replace it with a new four-lane upper deck.

The Highway Department originally opted for the third course because of funds limitations, but indicated interest in exploring other solutions suggested by area local governments. Execution of the third course of action would have involved closure of the ASB for at least two years, and would have imposed severe economic and social dislocations on the whole Kansas City metropolitan area.

Intensive continuing discussions among representatives of the State Highway Department

and the various local and county governmental jurisdictions most immediately involved resulted in the Highway Commission more than doubling its original commitment of \$27 million and pledges of more than \$11 million toward construction of a new bridge by Jackson and Clay Counties and the cities of Kansas City, North Kansas City, Liberty, Gladstone, and Avondale. The money is to be paid over a 6 year period. The pledge of these revenues by local and county interests has resulted in a decision by the State Highway Commission to authorize the preparation of contracts and preliminary engineering studies for a new ASB Bridge whose total cost is expected to approximate \$70 million at today's prices.

Under the terms of the proposed plan, the Highway Department will assume all costs associated with the project except the cities and counties most directly involved. Those cities and counties will assume the financial responsibility for:

1. The pier widening necessary to support any widened bridge deck which may be called for by traffic demands in the future.
2. The right-of-way acquisition and relocation work for the bridge and its approaches.
3. The required utility relocations and adjustments, provided they are not assumed by the utility companies themselves.
4. Providing relief from any responsibilities for the ASB rail structure.

Plans call for the existing ASB Bridge to be kept open to traffic during construction of the new structure, thus avoiding the economic and social disruptions which would result from closure.

So plans are being advanced to build a new bridge in metropolitan Kansas City, keeping open a vital link for traffic in the area and keeping alive a vital part of the metro area's heritage. When the new bridge is built it will be, among other things, a monument to the kinds of good things that can happen when state and local governmental jurisdictions work constructively and cooperatively together on problems of mutual concern.

1978 PRODUCES BITTER WINTER: POTHOLE DAMAGE EXTENSIVE

Routine maintenance activities planned for Spring, 1978 were set back for a more urgent effort: repair of potholes resulting from one of the most severe winters in Missouri history.

Extreme amounts of snow, moisture, cold, and chemical used to keep roadways clear all took their toll on road surfaces and bridge decks.

Repair of the winter-caused potholes was given a priority intending to eliminate the most critical damage in the shortest possible time. When the first good weather arrived in late March and early April, all State Highway Department maintenance personnel available were put to work. This included overtime and weekend work in those critical situations requiring it.

More permanent and extensive repairs to the winter damaged roads and bridge decks were made throughout the summer, when improved weather conditions were more conducive to this kind of work.



This enlarged photo of a pothole shows the damage freezing, salt and heavy traffic produce.

V. REPORTS FROM THE DIVISIONS

Accounting: Expenditure Control

The accounting and expenditure control for the State Highway Department is the direct responsibility of the Accounting Division. All of the Department's records of financial transactions are processed and recorded by this Division.

Based on anticipated revenues and disbursements, the Division prepares legislative budget requests as well as annual internal budgets.

The Division reviews all payment documents for accuracy, priority of payment and to determine if funds are available prior to recording and certification for payment.

The Division processed 186,633 checks during 1978, which represents disbursements of \$448,320,847.20. Disbursements through Gas Tax Refunds and Other State Departments from Highway Funds equaled \$64,104,843.49. Total disbursements from Highway Funds for 1978 equaled \$512,425,690.69.

Payments for Workmen's Compensation and medical care are made by the Department's insurance carrier; however, these payments are routed through the Accounting Division and recorded to insure absolute accuracy of fiscal records. There were 722 Workmen's Compensation cases processed this year.

The Division is presently involved in formulating written procedures for each job description to facilitate uniformity in work performance, to aid in the cross training of present employees and to aid in the training of new employees.

The Accounting Division has the responsibility for administering the regulations and policies of the Highway Employees and Highway Patrol Medical and Life Insurance Plan. As of December, 1978, there are 8,610 health insurance plans and 8,222 life insurance plans in force. For the period from February 1, 1978, through December 31, 1978, there were 5,913 health claims with \$3,640,323.41 paid out in benefits and 28 life claims with \$130,746.07 paid to survivors in benefits.

Bridge: 102 Designs Completed

This Division is responsible for the design of all bridge structures on the State Highway System.

During the year, 102 designs were completed by this Division. Of this number, 89 were designed for major system routes with 13 to be built on supplementary routes.

The total length of all new structures contracted for during the 1978 calendar year amounted to 39,105 feet at a cost of \$47,916,428. Of these amounts, 1,503 feet costing \$1,929,748 were designed for supplementary routes.

Included in the above statistics are portions of two large structures. A contract for fabrication and erection of five units of plate girder structural steel was let for the 6,658 foot Riverfront Viaduct in St. Joseph at a cost of \$3,527,946. Also included is a structural steel contract for 11 spans of the 3,197 foot Route I-44 structure in St. Louis at a cost of \$1,946,662.

In addition to the above, 36 designs were prepared for repairing, widening or extending 11,508 feet of existing structures by contract at a cost of \$16,277,967.

Design services were again extended to counties for design of county road bridges under the Federal Highway Administration Off-System Program.

The program of rating all bridges on the State Highway System is being conducted by this Division. This is a process of compiling data from the bridge plans, assigning numerical values to this data which in turn is incorporated into a computer program. The product is a rating which expresses condition and load carrying capacity of the bridge. A potentially dangerous situation was averted in the past year when many older bridges throughout the State were found to be unsafe for today's heavy loads. As a result, these bridges

were posted to warn the traveling public, pending the availability of funds for their eventual replacement.

A structural engineer of this Division was selected by the Federal Highway Administration and the Ministry of Communications, Department of Highways of Saudi Arabia, to serve as a member of a ten member inspection team from the United States to inspect, inventory and evaluate the bridges in that country.

A hydraulics engineer from this Division was selected by the Federal Highway Administration and the U. S. Water Resources Council to participate in a national interagency test of procedures for estimating flood frequencies.

This Division was host to three civil engineers from the People's Republic of Poland and conducted a training session on their behalf in concrete bridge design and construction. Their visit was arranged through the United Nations in cooperation with the Federal Highway Administration to study bridge design in the United States.

Construction: \$251 million awarded

The money value of work completed in 1978 was a record high, being more than 24 million dollars greater than the highest previous year.

Interstate Route 35 in the Pattonsburg area was completed closing the final gap in the I-35 facility between the Kansas border at Kansas City and the northern border of Missouri at Iowa.

The final portion of Interstate Route 57 was completed and opened to traffic by completing the section between Charleston and the

Missouri-Illinois border near Cairo, Illinois. This portion included a bridge across the Mississippi River.

On Interstate Route 44 several projects were active in the central part of the state upgrading this route to full interstate standards. Contracts on approximately five miles in the Waynesville area remain to be let for final completion to basic interstate standards.

Interstate Route 170 was added to the Interstate System between Route I-270 and Route I-70. Several projects were let for the construction of this facility in St. Louis.

The Interstate Route 70 bridge over the Missouri River near St. Louis was opened to traffic by accelerating the construction schedule to provide for the alleviation of traffic congestion in this area. A contract has also been awarded providing for the construction of a new deck and some pier repair work on the original Missouri River Bridge on I-70 at this location.

Contracts were let to increase the capacity of Route I-40 at Vandeventer Avenue and Route I-44 at 3rd Street in the downtown area of St. Louis.

We continued to upgrade testing equipment for greater efficiency in contract control and continued to increase the capacity of personnel by technical training.

Awards were made on 384 construction projects in 1978. This represents 1,468 miles of road construction. One hundred fifty-six projects included Federal-Aid, while 228 projects were financed entirely by state funds. The money value of the awards, including engineering and non-contractual costs, totaled \$251 million. The breakdown is as follows:

Approximately 90 million dollars for the Interstate System.

Approximately 118 million dollars for the Primary System.

Approximately 34 million dollars for the Supplementary System.

Approximately 9 million dollars for non-contractual costs.

Total = 251 million dollars.

The Interstate System contracts involved new construction, upgrading existing dual facilities to Interstate standards, rest areas, highway beautification, and implementing the latest safety features for highway traffic. Approximately 23 miles were completed to Interstate standards this year. There are now under construction approximately 43 miles of

Interstate road. Missouri has 1,068 miles of Interstate roads up to Interstate standards, and an additional 5 miles of Interstate roads in use as a dual facility but not up to the full standard.

The Primary and Supplementary System contracts include costs of construction work in rural and urban areas and projects financed either with Federal-Aid or with 100% state funds. They include new construction, bridge replacements, widening, and highway beautification projects. Where applicable, the latest safety features were included.

Below is a resume of the projects under construction that have not been completed.

ACTIVE PROJECTS AS OF DECEMBER 31, 1978

<u>System</u>	<u>Contracted in 1975</u>	<u>Contracted in 1976</u>	<u>Contracted in 1977</u>	<u>Contracted in 1978</u>	<u>Total</u>
<u>FEDERAL AID</u>					
<i>Interstate</i>	0	5	22	24	51
<i>Primary</i>	1	7	23	36	67
<i>Supplemental</i>	0	2	10	11	23
<i>Off-System</i>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>7</u>
Sub-Total (FA)	1	14	55	78	148
<u>100% STATE</u>					
<i>Interstate</i>	0	0	0	2	2
<i>Primary</i>	0	1	25	51	77
<i>Supplemental</i>	<u>0</u>	<u>0</u>	<u>7</u>	<u>58</u>	<u>65</u>
Sub-Total (ST.)	0	1	32	111	144
GRAND TOTALS	1	15	87	189	292

Equipment and Procurement:

New System Defines Downtime

This Division is responsible for procuring and maintaining a fleet of equipment that will efficiently and effectively permit the Department to carry out its functions. At the close of the year 1978 the Division was maintaining 6,326 rental units consisting of passenger cars, trucks, carryalls, tractors, mowers, motorgraders, and various miscellaneous units.

The Division has developed a method of defining equipment downtime in a continuing effort to more efficiently manage the fleet. The new program has been implemented in one District for evaluation purposes. Modifications have been made to the original plan and it is intended to implement the system statewide.

The information gleaned should identify potential problems in manpower production, parts availability, and particular makes and models of machinery that are not suitable or economical for Department operations.

It required 8,627,089 gallons of gasoline, 291,447 gallons of kerosene, and 2,065,244 gallons of diesel fuel to operate the fleet. In addition, 73,964 gallons of anti-freeze, 114,655 gallons of lubricating oil, 47,193 gallons of hydraulic oil, and 112,367 pounds of multi-purpose gear oil and lithium grease were used. Tires and tubes costing \$629,261.10, tire chains costing \$94,074.50, and shop equipment, parts, and supplies totaling \$4,064,931.00 were contracted for during the year.

The Headquarters Sign Shop produced a total of 114,610 signs and markers of various shapes and sizes amounting to \$1,472,324.84 during the year.

The Division is also charged with the responsibility of providing all tools, supplies, and materials that are required in the operation of the Department. The quantities of the various materials purchased for use in the maintenance of the highway system are listed below:

Various Types of Asphalt	59,803,494 Gallons
Gravel	1,110,998 Cubic Yards
Stone and Chat	1,551,065 Tons
Paint	590,359 Gallons
Reflectorizing Spheres	2,571,800 Pounds
Sodium Chloride (Winter 1977-78)	126,650 Tons
Calcium Chloride (Winter 1977-78)	6,142 Tons
Treated Sign Posts	35,455 Posts
Steel Sign Posts	29,942 Posts
Grader and Maintainer Blades	1,166,292 Pounds
Agricultural Seed	48,500 Pounds
Mower Parts	\$343,125.92

Legal: Litigation, Hearings, Contracts

During the year 1978, this office instituted condemnation proceedings in the various circuit courts of the state for the purpose of obtaining right-of-way for new highway construction projects involving 281 tracts of land. A total of 333 condemnation cases were disposed of during the year at the trial court level, and there were 15 appellate court decisions involving cases in which the State Highway Commission was a party.

The sum of \$570,331.44 was collected in payment of final judgments in condemnation proceedings in which the final judgment was less than the amount which had originally been awarded by the condemnation commissioners and paid into court. The sum of \$46,621.25 was collected in miscellaneous matters. There were 10 new actions filed on behalf of the Commission to collect for damage to Commission-owned property, and 41 such pending suits were disposed of. The sum of \$421,739.33 was collected on 1,915 claims for damage to State Highway Commission property. This amount includes all amounts collected by virtue of litigation, as well as amounts collected without the institution of court action.

During the year, 26 actions were filed in court naming the State Highway Commission as a party involving various types of claims.

There were seven cases instituted on behalf of the Commission for the purpose of obtaining compliance with the statutes relating to the operation of junkyards and final disposition was

effected in two such cases. Compliance was obtained in 12 instances between operators of junkyards without resort to litigation.

There were no formal contested hearings before the Public Service Commission in regard to railroad-highway crossings, however, 25 applications regarding such crossings were filed and final orders obtained by agreement with the railroad company without the necessity for a formal hearing.

During the year, seven actions, in addition to the cases enumerated above, were filed on behalf of the Commission for various reasons, such as injunction proceedings.

Numerous administrative hearings were conducted. Five such hearings involved the relocation of utility facilities to permit the construction of new highway projects. One hundred six administrative hearings were conducted in reference to the enforcement of the statutes relating to the control of outdoor advertising involving 213 outdoor advertising signs. Twenty-two cases were filed in circuit court seeking a review of Commission orders relating to the control of outdoor advertising signs, and three cases were filed on behalf of the Commission to compel the removal of unlawful advertising signs.

In addition to the litigation and administrative hearings handled by this office, numerous contracts to which the Commission was a party were prepared and approved.

Maintenance and Traffic Division: Energy Conservation, Permits, Speed Studies

During 1978 the total mileage of roadway maintained by the Division increased 51 miles to a total of 33,783. This mileage includes recreational access roads, outer roadways, service roads and maintenance agreement sections.

One of the Maintenance Division's major objectives has been to discontinue road mixing on all routes with an Average Daily Traffic in excess of 500 and on all numbered routes with an ADT over 225. This objective has been accomplished by use of our Contract Leveling Course, Contract Seal Coat and Contract Premix Programs, and off road stockpile site mixing with either motorgraders or pug mills.

The Contract Leveling Course Program has proved to be an excellent way of meeting the off road mixing objective. This is basically a one inch hot mix machine laid overlay. To be eligible for inclusion in this program a road must carry over 500 ADT, have a constructed base, and have a build up of 2 or 3 inches of mat. Exceptions to this criteria are made if they provide continuity to the machine laid system or constitute short stubs into or through towns. There are currently approximately 6,750 miles of roads eligible for inclusion in this program. In 1978, 923.4 miles or 13.7% of the eligible mileage were resurfaced under this program.

During 1978, in addition to the 923.4 miles of Contract Leveling Course, we also completed 242.6 miles of seal coat, 1,033.5 miles of premix, and 614.9 miles of stockpile mixing, for a total of 2,815.3 miles of off road mixing. This is equal to 40% of our total maintenance surface treatment program.

Another major objective has been the reduction in the usage of cutback asphalt in an effort to conserve energy. The use of emulsified asphalt in place of cutback asphalt has several advantages including the reduction in the amount of distillate resulting in less hydrocarbons being released into the air and less energy for heating. Emulsified asphalt also reduced the bleeding and the resulting tracking of fresh asphalt by cars.

In 1974, we used 1,000,000 gallons of emulsified asphalt. We have steadily increased the usage until 1978 when we used 28,000,000 or approximately 47% of our total asphaltic usage. By using emulsified asphalt, we saved approximately 1,960,000 gallons of distillate or fuel oil in 1978.

In 1978, we used approximately 59,803,000 gallons of asphalt and 2,160,000 cubic yards of aggregate. Other major maintenance items included mowing of approximately 386,000 acres of right-of-way and the expenditures of \$823,101 on litter pickup.

The Maintenance Division has an objective to provide chemical storage buildings for all sub-areas where calcium chloride and sodium chloride are used. During 1978, we built 42 additional buildings. With the completion of these additional buildings, we have provided 65% of our Maintenance sub-areas with chemical storage buildings.

During 1978, we built 5 concrete block buildings (44 bays), 3 corrugated metal buildings (26 bays) and 2 special metal buildings (20 bays) to house equipment and supplies. A program to insulate and partition older buildings to conserve energy is also in progress.

The Department in an effort to conserve energy has been building pool parking areas in and adjacent to the metropolitan areas. This program was started in 1975 with the original construction of 717 spaces. Since the original construction, we have added 1,070 parking spaces by the construction of new areas and expansion of existing areas. In December, 1978, we had 1,787 spaces of which 322 were built in 1978 or an increase of 22%. Also, the average daily usage in 1978 increased from 786 to 956. In 1975, we had an average usage of 42% of the available space. This has increased where, in 1978, we had a daily occupancy average of 53%.

The winter of 1977-78 was much more severe than the previous winter and in our snow removal operations, we used 132,768 tons of

chemicals. This amounted to a 40% increase in usage over the previous year. Our total cost increased from \$12,100,637.00 to \$17,882,537.00 or an increase in expenditures of 48% to provide safe surfaces for traffic to use during and immediately after ice and snow storms.

Division personnel made routine inspections of all state maintained bridges to determine their condition and needed repairs. This inspection included approximately 6,400 bridges on the state highway system. Thirty-five are Missouri or Mississippi River crossings, 19 of which are jointly maintained by the adjacent states. Sixty-four special condition inspections were performed so that the loading capacity could be determined.

Division repair crews completed structural repairs to 86 bridges. This included the strengthening of 3 structures that had deficient load carrying capacity. Three structures were also repaired because of major collision damage.

Division paint crews completed 101 bridges during the year. This amounted to approximately 4,350 tons of structural steel that was painted.

In the early 1960's the Maintenance Division started a project of treating all new bridge floors with a mixture of 50% linseed oil and 50% mineral spirits to protect the bridge floors from chloride damage. The initial treatment is done by the contractor upon completion of the bridge. The bridge floor is then treated annually by maintenance forces until they have received 5 consecutive treatments. In 1978, 351 or 5.5% of the bridges in the state highway system were treated.

During 1978, a training program was developed on performance appraisals. This training program was presented to all highway maintenance foreman and maintenance area supervisors during the months of June and July.

The Department has had a long range objective of building and maintaining rest areas on the Interstate system. During 1978, a new

rest area at Doolittle in Phelps County on I-44 was opened and a tourist center at Marston on I-55 New Madrid County was opened. We now have 17 rest areas in service. Currently we have rest areas in Warren County and adjacent to the Jefferson Barracks bridge in St. Louis County under contract.

In an attempt to improve the vegetation in urban areas, contracts were let to fertilize 3,879 acres during 1978. To control Johnson Grass, we let contracts for spraying of 7,486 acres. In addition 4,676 acres were sprayed by maintenance forces. The majority of the Johnson Grass spraying was done in the 19 counties which have adopted the Johnson Grass Law which requires the Highway Department to control Johnson Grass on our right-of-way. In these counties if our right-of-ways are infested with Johnson Grass, we attempt to prevent it from spreading to adjacent property. In addition, if Johnson Grass infests our right-of-way and adjacent property in any county and the adjacent property owner is attempting to control the Johnson Grass, we will also take corrective action on our right-of-way.

Some 88,989 special overdimension and/or overweight permits were issued during 1978. Of this total, 29,768 or 33% were issued by the 10 district offices. Included in the total were 1,408 special permits issued to governmental agencies or sub-divisions with charges.

One of the major accomplishments of our Division was the construction of our Sign Reclamation Plant. This plant was placed in operation in September of 1977 and during the remaining months of that year we were able to reclaim 9,000 signs with a total square footage of 40,000. During 1978, we reclaimed 37,000 signs with a total square footage of 157,000. Through the operation of this plant we were able to realize a savings of \$1.09 per square foot for every sign provided to the Districts. The savings to the state through this operation during 1978 amounted to approximately \$171,000.00.

In a continual operation to safely mark all state highways carrying over 225 ADT, we either

Maintenance and Traffic, continued

striped a centerline on the lower volume roads or centerline with no passing zone on higher volume routes. In 1978, we placed a total of 71,400 miles of stripes. This total includes 39,100 miles of centerlines and lanelines, 21,700 miles of edgelines and 10,600 miles of no passing zone. To complete this work approximately 503,500 gallons of paint and 2,530,800 pounds of reflectorized glass beads were used.

During 1978, 69,230 accidents which occurred on the State Highway System were coded and placed in the accident data record system. These reports were provided by the State Highway Patrol and approximately 500 City and County law enforcement agencies.

Speed studies were conducted at 210 locations and traffic volume counts were made at 235 locations.

We continued our 120/medium program in 1978 and 53 locations were investigated where a higher than normal number of accidents had been occurring. At 42 of these locations, corrective measures were implemented.

Twenty-five locations were investigated and countermeasures evaluated for possible funding under sections 209 of the 1973 Federal Highway Act. Eleven of these locations have been tentatively programmed for improvement on the Right-of-Way and Construction Program.

There were 1,060 billboards removed by property owners and 45 removed by State forces under the Outdoor Advertising Laws and Regulations.

Activities funded from 402 Program funds under the 3+ Standards of Missouri Highway Safety Work Program as coordinated by the State Highway Department are as follows:

The Traffic Engineering Assistance Program - This is a program established to aid political subdivisions with traffic engineering problems where a comprehensive view is

required and where the subdivision does not have personnel available to carry out the review. The services are performed by a consultant retained by the Department for this purpose. During 1978, 82 studies were conducted in 59 political subdivisions. This was a decrease of 37 studies from 1977, however, the studies were much more complicated and the average cost increased \$700.00 each to an average cost of \$1,700.00 per study.

Bridge Engineering Assistance Program - This is a program established to aid political subdivisions in obtaining information on the structural adequacy of bridges under their jurisdiction. These services are performed by two consultants retained by the Department on a yearly contract. These services include in addition to determining the structural adequacy, the inventory of off system bridges including the establishing of posted weight limits and priorities for repairs or replacement of bridges. Structural adequacy reports and inventories were conducted on approximately 1,500 bridges during the year costing a total of \$417,206.00.

Other activities included the preparation of the Condensed Traffic Principles Handbook for Small Cities. This book is scheduled for completion and distribution early in 1979.

The 29th Annual Traffic Conference was held as part of Seminars and Shortcourse portions of our Annual Work Program. The conference had 85 participants from various county, city, state, and federal governments. The 1978 conference dealt with traffic improvements for cities and counties.

As a continuing maintenance operation, replacement parts for existing impact attenuator installations in the St. Joseph, Kansas City and St. Louis areas were purchased with 402 funds. Some \$38,854 was spent in 1978 for the purchasing of these replacement parts.

We have established a formalized freeway surveillance program in the St. Louis and Kansas City metropolitan areas with systematic monitoring of peak period operations on a 170 mile system. Congested sections are pinpointed and subjected to additional investigation and ranked in order of congestion severity. Detail engineering studies of the most critical congested sections were initiated to isolate the cause of congestion and to evaluate alternatives to improve operating efficiencies.

During 1978, the two most critically congested sites in the state were the Missouri River Bridges on U.S. 40-61 and I-70, St. Louis - St. Charles Counties. On or adjacent to the U.S. 40-61 Bridge, recurring stop and go congestion prevailed for approximately two hours during peak periods with backups extending approximately two miles. As a result of this study, a reversible lane was implemented through the installation of overhead signals, signing and striping changes. October 3, 1978, the Department started operating the reversible lane. This had completely alleviated prevailing congestion resulting in free flow traffic operations during the peak periods. The resulting weekly savings to motorists is estimated to be 300,000 vehicle-minutes travel time and approximately 2,000 gallons of fuel.

The I-70 Missouri River Bridge was also causing considerable backup and delay to the

motorists. At times the backup would extend for three hours during the peak periods. A new structure was constructed parallel to the existing structure and opened to traffic in late November 1978, however, the old structure was closed for redecking when the new bridge was opened. To eliminate the traffic backup the new structure was signed and marked to handle three lanes of traffic in each direction. This structure, when the old structure is reopened, will become one way eastbound with four lanes of traffic and full width shoulders. The temporary measures of three lanes in each direction has completely alleviated prevailing stop and go congestion which had been experienced on the old structure.

To provide relief to traffic congestion at various intersections throughout the state that were not included in Right-of-Way and Construction Programs, maintenance contracts were let for signalizing 5 intersections. In addition, 9 intersections were signalized by maintenance forces. To modernize existing traffic signals throughout the state, maintenance forces upgraded or installed new traffic control equipment in 17 signalized installations. Permits were issued for the installation of traffic signals at 2 intersections. The program to interconnect various traffic signals for traffic progressions is continuing.

Materials and Research:

Quality Testing, Drilling, Research

The Division of Materials and Research is responsible for the quality of materials used in Maintenance and Construction of the State Highway System in Missouri.

The Division is charged with specific responsibilities. Field operations include the inspection, by personnel located within the ten districts, of materials utilized in highway construction and maintenance. A few examples to illustrate the magnitude of the inspection performed are as follows: approximately 9 million tons of crushed stone, sand and gravel and other aggregates are inspected or enough to fill 150,000 railroad cars; approximately 103 million gallons of bituminous materials, such as road oil and asphalt cement, are checked; approximately 19 thousand tons of reinforcing steel for concrete is inspected and if all of the drainage pipe inspected by the Materials and Research Division during 1978 were laid end-to-end it would reach from Jefferson City to the Lake of the Ozarks (approximately 55 miles). In addition, the Division designs all bituminous mixtures used throughout the State.

The Central Laboratory is located in Jefferson City and all materials requiring specialized testing that cannot be performed in the field, are shipped to Jefferson City where the testing can be performed. Also, some of the same tests are made that are performed in the field, in order to insure that field testing procedures are uniform throughout the entire State. The Central Laboratory receives periodic inspections and is a nationally recognized and approved laboratory for the testing of highway materials. Approximately 36,000 samples were tested in 1978.

The Materials and Research Division continuously studies new and old materials and procedures used in highway construction to bring about changes which result either in improved performance or a cost reduction while maintaining the desired high quality of highway construction and maintenance. The items studied and reported on in 1978 ranged from, why some bridge decks deteriorate faster than others, to what could possibly be done to decrease the amount of cracking in bituminous resurfacing. A total of six major research projects were completed and reported during 1978 and many minor projects, such as deck condition studies on individual bridges, were completed.

The Division is responsible for testing and recommendations regarding the soils, shales and rocks on which highways and bridges must be built. Each district has personnel to handle and plan the local work necessary. Drilling equipment used to obtain subsurface information is located in Jefferson City and is dispatched wherever the need arises within the State. Specialized personnel are available to analyze materials found beneath the earth's surface and make recommendations regarding the fills to be used on highways, the steepness of side slopes and any other items concerning the soils and geological formations encountered. Major projects performed during the year included approximately 89 investigations regarding bridge locations, one of which was completed for a new Missouri River Bridge proposed for Route 40 between St. Louis and St. Charles Counties, requiring placing the drills on a barge and drilling deep into the river bed.

The quantities of various materials inspected, tested and approved for 1978 included:

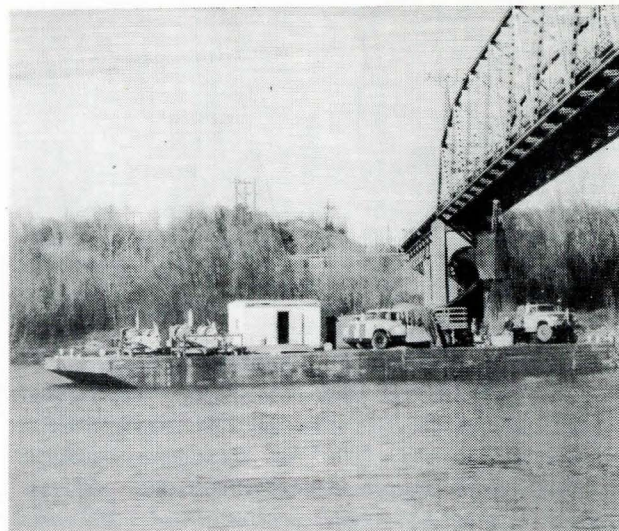
Aggregates	8,889,632 Tons
Cement	473,632 Tons
Reinforcing Steel	19,374 Tons
Culvert Pipe	
Corrugated Metal	97,766 Linear Feet
Vitrified Clay & Concrete	192,320 Linear Feet
Joints - Bituminous, Fiber and Metal	370,599 Linear Feet
Joints - Rubber	12,207 Square Feet
Guardrail	353,889 Linear Feet
Posts, Metal	133,238 Each
Lumber and Square Posts	677,510 Board Feet
Piling and Round Posts	3,442 Linear Feet
Bituminous Material	
Cutback and Penetration	72,754,296 Gallons
Emulsified	30,639,718 Gallons
Paint	559,998 Gallons

The grand total of samples tested in the Laboratory during 1978, including those of an experimental or investigational nature, amounted to 35,989.

Personnel Division: Co-Op Program, Training, EEO Efforts

The Personnel Division is an administrative unit of the Missouri State Highway Department, providing assistance to the Headquarters Divisions and the ten Districts regarding personnel management such as employment, affirmative action, employee development and training, employee relations, wage and salary administration and application of personnel policies.

During 1978, Personnel Division representatives again conducted a campus recruiting program, visiting accredited civil engineering colleges in Missouri to secure graduate



Drilling operations for a new bridge over the Missouri River near Weldon Springs, on U.S. Routes 40-61.

engineers. Increasing demand and rapidly rising salaries for engineers continue to pose difficulties in recruiting needed replacements. The Department employed eight new graduate engineers through campus recruiting and eight graduates through other sources.

Recruiting qualified applicants to staff other job openings in Headquarters Divisions also posed difficulties in some areas where certain skills are in short supply.

The Missouri State Highway Department is an Equal Opportunity Employer. Affirmative Action Programs remain a high priority

Personnel, continued

throughout the Department and significant progress continues. Recruiting efforts by both Personnel Division and District personnel were intensified to locate qualified minorities, including female and other protected group applicants, for Department job opportunities. During the year, approximately 175 additional minorities were employed throughout the state. Minority separations partially offset minority employments, however, the Department's overall goal appears to be attainable.

Orientation and training of new employees is primarily conducted through the Department's supervisory personnel. The Personnel Division provides each new employee with several publications to assist in familiarization with the Department's function, working rules and regulations, and employee benefits.

Employees, in obtaining the fundamental knowledge of their job, may become eligible for attendance at training conferences and seminars related to their specific work assignments. Most technical skills training is provided by operational Divisions utilizing staff with the necessary expertise. The Personnel Division supplements employee training by structuring and coordinating an on-campus supervisory skills seminar. A seminar was again held in 1978 for designated supervisory levels, instructed by the University of Missouri faculty and tailored specifically for the application of supervisory principles to the policies and needs of the Highway Department. The seminar includes special emphasis regarding the supervisor's role in administering a successful affirmative action program.

The Highway Department operates, in conjunction with the University of Missouri, a "Co-Operative Civil Engineer Training Program", coordinated by the Personnel Division. This work-academic program is designed to provide promising civil engineering students with highway technical experience, while alternating work phases with periods of attendance at the University of Missouri at Columbia or Rolla.

Students graduating from this program have acquired actual experience in all phases of Highway Engineering, and become productive with a minimum amount of orientation and training. At the end of the year, fifteen students were participating in this program. The Co-Op Program is also beneficial when campus recruiting becomes difficult.

Internal training programs, conducted by Department staff, are held as specific needs indicate. For example, Maintenance and Traffic Division personnel conducted a training session in 1978 for Maintenance Supervisors in employee Performance Appraisal, and the Bridge Division conducted a training session for employees involved in the Field Bridge Inspection Program.

The Department continues to seek better ways to maximize utilization and development of its human resources, minimize costly employee turnover, and maintain a work environment conducive to high employee morale and motivation. The Personnel Division participates in numerous projects toward this end.

During the year, the Department implemented a formal written employee grievance procedure, whereby employees may communicate their concerns in an orderly and objective manner, with the assurance of a fair review and response. This procedure enhances upward communication and resolves many potential employee concerns quickly at the lowest level possible.

All personnel transactions are monitored to ensure equitable salary administration and policy administration, whereby employees are treated with fairness and with the highest degree of uniformity. Numerous job evaluations are conducted by the Personnel Division to maintain both accurate job specifications and internal salary equity between Department jobs.

The Highway Department makes every effort to maintain an adequate salary structure and employee benefits program, subject to

budgetary limitations. The Personnel Division provides assistance through conducting surveys and formulating recommendations. The Personnel Division also conducted a review of prior wage service credit awarded employees toward retirement to determine equity under the present retirement statutes.

Improvements were made in the centralized personnel records through further data processing applications. These improvements will result in more rapid recovery of the personnel data required for increasing State and Federal reports, with a reduction in time spent on manual compilation of data. A program to implement Unemployment Insurance coverage for Department employees was also established.

Numerous reports and special studies were compiled by the Personnel Division during the year as needed by the Department staff to analyze effective utilization of Department employees and the progress of various programs.

The Department had 6,604 salaried employees on December 31, 1978, compared to 6,573 on December 31, 1977. Several hundred temporary employees were hired during the summer to supplement the permanent staff on seasonal work. A large number were engineering students. Temporary employees were hired as needed for emergency work such as road maintenance during snow storms. The number of salaried employees has declined through attrition since 1971, when the number was 6,927.

During the year, 125 employees retired from the Department, of which 8 were between ages 55-60 with 15 or more years' service, 58 were between ages 60-65 with 15 or more years' service, 24 were between ages 65-70, and 35 qualified for disability benefits. Early retirement, prior to age 65, continues to be the trend. The Highway Employees' and Highway Patrol Retirement System has 1,653 Highway Department Retirees. The Department monitors pension system trends to evaluate what improvements in Retirement System benefits are feasible while maintaining actuarial soundness.

EQUAL EMPLOYMENT OPPORTUNITY (TITLE VI)

MINORITY BUSINESS ENTERPRISES

As part of its overall Affirmative Action Program, the Missouri State Highway Department is committed, under Title VI, to encouraging, developing, and implementing programs to assure that Minority Business Enterprises are afforded every opportunity to participate in state and federally-assisted programs, as contractors, consultants, and suppliers. A Minority Business Enterprise is a business of which at least 50 percent is owned by minority group members.

One problem for minority contractors has been the requirement of becoming "prequalified" in order to perform federal-aid work. The

Highway Department does not require "prequalification" for contractors to bid on highway construction projects. Prime contractors, are, however, required to have on file with the Missouri State Highway Commission a valid contractors questionnaire showing all of the assets and liabilities of the individual, partnership, or corporation. Subcontractors are not required to have a valid contractors questionnaire on file.

The Highway Department has made an effort to reduce the size of selected contracts to provide more entry opportunities for smaller, less experienced minority firms. The Department has

also allowed joint ventures by minority firms in order to provide more entry opportunities.

The Department distributes annually an updated list of Missouri and surrounding area minority-owned businesses, categorized by area of expertise, location, specific product or services to all contractors qualified to bid on work and to political subdivisions having initiated FAU projects, encouraging them to use the minority firms when possible.

Bidders on construction projects in Missouri are required to certify whether or not they intend to subcontract a portion of the work and if so, to take affirmative action in attempting to utilize minority firms on portions they intend to subcontract.

The Department works with and through minority agencies and contractor associations in

an effort to increase minority participation on State highway construction projects. Copies of news releases advertising lettings are sent to minority newspapers as well as associations for minority contractors.

Through its affirmative efforts, \$2,252,829 in federal aid contracts and subcontracts were awarded to minority firms by the State Highway Department during Fiscal Year 1978. This is a significant increase over last years' awards of \$1,544,966, which were a record high, and was the highest dollar total for Region 7, which includes the States of Iowa, Kansas, Nebraska, and Missouri.

The Highway Department will continue its efforts to further minority business participation in state and federally-assisted programs.

Planning Division: Traffic Statistics, Plans, Maps

The Division of Planning collects and maintains statistical data on the various characteristics of the State Highway System. This data is evaluated and reports prepared with appropriate recommendations. A historical record of the development of this system of roads is also maintained.

The Division participated in the cooperative, comprehensive and continuing transportation planning process in the urbanized areas of the state. Through this process, transportation needs are evaluated to assist local, regional and state officials in developing future transportation plans.

Traffic volumes were collected at approximately 4300 locations throughout the state for use in determining traffic trends, needs studies, urban and state traffic maps, and vehicle miles of travel statistics. Traffic study reports were prepared and distributed for six urban areas and truck surveys were conducted at 12 weigh

stations to determine weight trends of the various truck classifications. Vehicle speeds on the State Highway System were monitored at 74 locations throughout the state to develop speed trends of the traveling public.

The Division of Planning prepared the 1979 Cost Estimate for Completion of the National System of Interstate and Defense Highways. A service rating was published evaluating the condition, safety and traffic capacity of all interstate and primary routes on the State Highway System. Records of physical and geometric data for all roads and bridges on the State System were updated, and used to evaluate the needs on all roads and structures on the State Highway System.

During the past year a total of 1,250,000 copies of the Official Highway Map were printed and distributed. Also, twenty-two county

highway maps were updated and eighty-one city or urban vicinity maps were revised or redrawn. The trends of income and expenditures were closely monitored and this information was used in developing the Right-of-Way and Construction Program. Included in this Program were 1140 individual improvement projects which were categorized into projects approved for obligation of funds and projects approved for design.

During the year the tables for 1977 travel and accidents were prepared. Also the Maintenance Scheduling Reports for Kansas City and St. Louis were updated and published.

As of December 31, 1978, the State Highway System of Missouri involved 32,170 miles, as shown by the following table.

STATUS OF THE STATE HIGHWAY SYSTEM AS OF DECEMBER 31, 1978

<u>SYSTEM</u>	<u>ROAD MILES</u>
Interstate	1,097.604
Primary	6,810.209
Supplementary	<u>24,262.517</u>
TOTAL MILES	32,170.330
 <u>TYPE</u>	
Oiled Earth	0.000
Granular	6.407
Low Type Bituminous	25,069.295
High Type Bituminous	4,117.575
Concrete	<u>2,977.053</u>
TOTAL MILES	32,170.330

Public Information: Keeping Current

Missourians from all walks of life continued during 1978 their well-established high degree of interest and involvement in highway and highway-related matters. Because they did, the Public Information Division continued during the year to disseminate information about almost every facet of highway planning, highway construction, and systems operation.

A continuous flow of information about the state highway program was maintained through the year. News releases, radio programs, and graphic displays were prominent among the means used. Public Information Division personnel were in almost continuous contact with members of the state's news media, to whom extensive amounts of information were distributed -- both routinely and in response to special requests.

During the year, members of the Division prepared and distributed more than 450 news releases. In addition, numerous special articles, feature stories and photographs were supplied to newspapers, magazines, and other publications.

The Division also published and distributed **Missouri Highway News**, whose circulation at year's end was approximately 9,000 copies per month.

Fifty-two radio programs were produced and distributed to about a hundred commercial broadcasters throughout Missouri.

Speeches were prepared for presentation by Highway Department officials from the Headquarters Office and the several Districts. The Division also prepared and published the Highway Commission's Annual Report and Biennial Report.

Information, continued

A clipping service was maintained to keep Commission members and Department officials informed about newspaper coverage of and comment on highway affairs. Daily compilations were made from all newspapers in the state, and information also was collected to provide data on traffic study needs, to supply financial data from Missouri's counties and cities for Planning Division studies, and to record the details of highway fatalities.

The annual Highway Gardens exhibit at the Missouri State Fair was seen by more than 300,000 people.

More than 200 mail and telephone requests per month were answered by Division personnel. These requests involved, among other things, maps, road and travel information, historical information, routings, educational materials, and films.

The annual service awards program for employees with 25 to 45 years of service also was conducted.

The Division also supervised the distribution of about 1.25 million highway maps during the year, and the Highway Department's technical library was located in the Division.

Right-Of-Way Division: Successful Negotiations

During 1978, the cost of right-of-way acquired for highway construction totaled \$22,089,966.

The Division acquired 1,010 parcels -- 760 by negotiated settlement and 250 by condemnation or 75 percent by negotiation and 25 percent by condemnation.

Payments totaling \$1,108,585.89 were made in 1978 under the Relocation Assistance and Payment Program to assist displaced families, business and farm operations in relocating. During the year 417 relocation claims were processed and paid.

During the year, the Right-of-Way Division obtained appraisals for 1,360 parcels. Two separate appraisals were prepared for 26 percent of the parcels involved, making a total of 1,736 appraisals produced. An average of 113 parcels were appraised each month, which required an average production of 143 separate appraisals per month.

Receipts from the sale of improvements located on right-of-way acquired for highway construction and from the sale of excess property totaled \$715,863.75.

Rental of advance acquisitions and excess property resulted in an income of \$106,016.99. An additional \$4,320.36 was derived from miscellaneous sources.

The Division is actively engaged in implementing the Highway Beautification Act which relates to the removal of nonconforming outdoor advertising signs and salvage yards.

Surveys and Plans Division: Road Improvements and Contract Lettings

The primary responsibility of the Division of Surveys and Plans is to develop plans for road improvements and to place those projects under contract for the construction of the road improvement.

The development of plans has become a very complex and lengthy process. It no longer is a simple engineering problem to develop plans for a project. Added emphasis has been placed on public involvement in development of a project. At a minimum, this involvement consists of one to two formal public hearings where all facets of a project are discussed. In addition, numerous other meetings and contacts are involved in the course of project development.

Project development also includes assessment of the environmental impact of a

project with development of a full environmental impact statement for more complex projects. This statement analyzes all socio-economic and cultural aspects and involves many disciplines other than engineering to develop.

A noise study is prepared for many projects. This study determines areas where noise levels may exceed established standards and where control measures may be necessary. Noise information is also furnished to communities so this factor may be taken into consideration in future changes of land zoning.

An evaluation of air quality is also made, and clearances are obtained to permit a project to continue.



Maintaining good working relations with contractors is important. Here, contractors and Dept. leaders meet regularly to share ideas; bat out solutions.

Surveys and Plans, continued

A cultural resource survey will often be required as a condition to the development of a project. As a result of this survey, mitigation measures are often necessary, such as an archaeological dig to satisfy requirements to allow a project to proceed.

Any project involving a stream crossing will require a "404 Permit" from the Corps of Engineers. Obtaining this permit many times becomes a time consuming process and may ultimately require special mitigation procedures to satisfy all requirements to permit a project to proceed.

Project development includes negotiation for and arrangements for adjustment of all utilities located within the proposed project limits.

Most of the mentioned requirements are a direct result of Federal requirements. Since Federal funds provide a major portion of funding for road improvements in Missouri, it is necessary to satisfy these requirements to be eligible for Federal funds.

Assuming that all requirements can be met, a project eventually reaches the stage where a project can be advertised for letting. In 1978 there were eleven lettings held, and construction projects totalling \$232,071,170.10 were placed under contract.

The following table provides a resume of awarded projects for 1978:

<u>1978 Report</u>	<u>Awards</u>	<u>Miles</u>	<u>Projects</u>
Interstate System	\$ 91,973,935.01	73.307	39
Primary System	\$104,712,744.44	346.170	124
Supplementary	\$ 35,384,490.65	94.738	60
Total: Construction By Contract	\$232,071,170.10	514.215	223
Maintenance Work by Contract	\$ 9,433,335.54	935.769	144
Off-Systems Roads Contract	\$ 2,017,797.41	19.592	21
FAU Funds (Awarded on State System)	\$ 1,573,802.30	0.961	4

For the eleven lettings held in 1978, an average of 3.17 bids were received per project, and the average project cost exceeded the engineers' estimate by 3.5%.

Price trends continued an upward trend with the 1978 Missouri Average Composite Cost Index reaching 255.3. The base of 100 was established for calendar 1967. The 1978 cost index reflects a 28.3 per cent increase over the 1977 cost index of 199.0.

In addition to the activities leading to the contracting of a project, the Division also administers several Federal Aid programs providing funding to cities and counties for road improvement projects.

The Federal-Aid Urban Program provides Federal funding to cities and urban areas over 5,000 in population. During 1978 approximately \$20,492,000 was obligated throughout the State from this program requiring a 30% match of local funds.

The Off-System and Safer Off-System Program is a Federal program providing Federal funding to counties and cities for road improvements not on a Federal Aid System. During 1978 approximately \$6,439,000 was obligated for improvement projects requiring a 30% match of local funds.

The Rail-Highway Program provides Federal funding to promote rail-highway crossing safety. Contracts were under negotiation for placement of 115 railroad signals on the Federal-Aid System which includes 52 locations on city streets. This program would result in an expenditure of approximately \$4,025,000. A program was also initiated to provide the minimum required warning devices at all railroad crossings in the

State. This would include all city streets and county roads. This program will involve placement of approximately 5,000 reflectorized crossbucks, 6,400 advance warning signs, and 2,035 advance pavement markings. The cost of this program would be approximately \$1,200,000. Seventy-three additional signals were also authorized on the Off-Federal Aid System city streets and county roads, which will eventually involve expenditure of approximately \$2,400,000. In 1978 Missouri was ranked number 1 in the nation by the U. S. Department of Transportation in the percentage of available funds being obligated for crossing safety. This accomplishment assures the taxpayer and traveling public that maximum use of funds is being made and that maximum benefits are being received.

INCOME-

MISSOURI STATE HIGHWAY DEPARTMENT STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR YEAR ENDED DECEMBER 31, 1978

Receipts

BASIC REVENUE:

Motor Vehicle License	\$ 100,808,061.44	
Motor Bus & Truck Fees	\$ 2,001,903.00	
Motor Vehicle Use Tax	\$ 16,346,486.97	
Drivers License Fees	\$ 4,796,252.03	
Motor Vehicle Inspection Fees	\$ 1,889,412.50	
Motor Fuel Tax Receipts	<u>\$ 181,496,706.93</u>	
		\$ 307,338,822.87

INCIDENTAL RECEIPTS:

Refunds - Highway Fund	\$ 145,808.63	
Transfer into Highway Fund		
for Patrol Airplanes	\$ 656,444.00	
Refunds - Road Fund	\$ 22,678,988.55	
Political Subdivision	<u>\$ 292,932.82</u>	
		\$ 23,774,174.00

FEDERAL AID REIMBURSEMENT:	\$ 146,633,771.18	
		\$ 146,633,771.18

MISCELLANEOUS ESCROW FEES:	\$ 561,020.49	
		\$ 561,020.49

INTEREST RECEIVED - STATE		
ROAD FUND BALANCE	\$ 4,450,561.22	
		<u>\$ 4,450,561.22</u>

TOTAL RECEIPTS		<u><u>\$ 482,758,349.76</u></u>
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DISBURSEMENTS-

CONSTRUCTION	\$ 302,226,629.50	
MAINTENANCE	\$ 119,908,075.62	
MISSISSIPPI RIVER PARKWAY COMM.	\$ 109.45	
ADMINISTRATION	\$ 21,407,785.11	
O.A.S.I. HIGHWAY DEPARTMENT	\$ 4,778,247.52	
GAS TAX REFUNDS	\$ 8,825,805.30	
OTHER STATE DEPARTMENTS	<u>\$ 55,279,038.19</u>	
TOTAL DISBURSEMENTS		<u>\$ 512,425,690.69</u>

MoDOT Library



RD0017706